

Claims

- [c1] 1.A supercharged motorcycle comprising:
a front wheel;
a rear wheel longitudinally spaced from said front wheel;
an engine including a rotatable crankshaft generally positioned between said wheels; and
an air induction system operable to deliver compressed induction fluid to the engine,
said air induction system including a supercharger and a drive assembly drivingly connecting the supercharger relative to the crankshaft,
said supercharger being longitudinally spaced forward of said crankshaft to define a fore area therebetween with the drive assembly spanning the fore area.
- [c2] 2.The motorcycle as claimed in claim 1,
said supercharger comprising a centrifugal supercharger including a self-contained dedicated lubrication system in which all of the lubricant is contained entirely within the supercharger.
- [c3] 3.The motorcycle as claimed in claim 1; and
a drive train drivingly interconnecting said crankshaft and said rear wheel and including a rotatable driven ele-

ment and an endless element drivingly interconnecting said crankshaft and said driven element, said driven element being aftwardly and longitudinally spaced from said crankshaft to thereby define an aft area between said crankshaft and said driven element.

[c4] 4.The motorcycle as claimed in claim 3, said drive assembly including a foremost rotatable supercharger-driving component longitudinally spaced from said crankshaft and positioned in or forward of the fore area, and an aftmost rotatable power take-off component longitudinally spaced from said crankshaft and positioned in or behind the aft area so that the drive assembly extends into and spans between the fore and aft areas.

[c5] 5.The motorcycle as claimed in claim 4, said power take-off component drivingly intermeshing with one of said endless and driven elements.

[c6] 6.The motorcycle as claimed in claim 5, said one of said endless and driven elements being said driven element, said driven element comprising a toothed flywheel.

[c7] 7.The motorcycle as claimed in claim 4, said drive assembly including an endless drive element

drivingly entraining said rotatable components.

- [c8] 8.The motorcycle as claimed in claim 1; and
a side cover at least partially enclosing said crankshaft,
said air induction system including a generally flat support bracket supporting said supercharger on said side cover.
- [c9] 9.The motorcycle as claimed in claim 1,
said air induction system including an intercooler positioned downstream of said supercharger and upstream of said engine.
- [c10] 10.A supercharged motorcycle for mounted operation by a rider, said motorcycle comprising:
a chassis operable to be mounted by the rider in a normal operating position and including a front wheel, a rear wheel longitudinally spaced from said front wheel, a frame supported between the wheels, a gas tank spaced between said wheels, a seat positioned aft of the gas tank and configured to support the rider in the normal operating position, and a pair of foot supports spaced on either side of the frame and positioned generally below the gas tank and the seat;
an engine including a rotatable crankshaft generally positioned between said wheels,
said chassis and engine cooperating to define a pair of

leg-receiving areas spaced on either side of the chassis and each being operable to receive a corresponding leg of the rider when the rider is mounted on the seat in the normal operating position,
each of said leg-receiving areas being generally defined by a curvilinear leg path extending between said seat and a respective one of said foot supports that mimics the corresponding rider's leg when the rider is mounted on the seat in the normal operating position; and
an air induction system operable to deliver compressed induction fluid to the engine and including a supercharger and a drive assembly drivingly connecting the supercharger relative to the engine to supply power from the engine to the supercharger,
said entire air induction system being positioned outside of the leg-receiving areas with at least a portion of the air induction system extending between said leg paths.

[c11] 11.The motorcycle as claimed in claim 10,
said at least a portion of the air induction system being positioned entirely inboard of the leg paths.

[c12] 12.The motorcycle as claimed in claim 10,
one of said frame and gas tank defining a pair of laterally outermost rider-engaging contact points oppositely spaced on either side of the chassis that engage the rider's legs when the rider is mounted on the seat in the

normal operating position,
each of said contact points being positioned along a respective one of said leg paths,
each of said foot supports presenting a foot-supporting surface for supporting a foot of the rider when the rider is mounted on the seat in the normal operating position,
each of said foot-supporting surfaces defining an outermost edge laterally spaced from said frame and an innermost edge adjacent said frame,
each of said innermost edges lying in a common plane with a respective one of said contact points,
each of said leg paths lying in a respective one of said common planes.

[c13] 13. The motorcycle as claimed in claim 12; and
a drive train drivingly interconnecting said crankshaft and said rear wheel and including a rotatable driven element and an endless element drivingly interconnecting said crankshaft and said driven element,
said supercharger including a rotatable impeller operable to compress induction fluid for the engine when rotated,
said drive assembly drivingly interconnecting said rotatable impeller and one of said driven and endless elements,
said drive assembly being positioned entirely inboard of said common planes so as to not engage the rider when

the rider is mounted on the seat in the normal operating position.

[c14] 14.The motorcycle as claimed in claim 13,
said supercharger being forwardly and longitudinally
spaced from said crankshaft to thereby define a fore area
therebetween.

[c15] 15.The motorcycle as claimed in claim 14,
said driven element being aftwardly and longitudinally
spaced from said crankshaft to thereby define an aft area
therebetween.

[c16] 16.The motorcycle as claimed in claim 15,
said drive assembly including a foremost rotatable su-
percharger-driving component longitudinally spaced
from said crankshaft and positioned in or forward of the
fore area, and an aftmost rotatable power take-off com-
ponent longitudinally spaced from said crankshaft and
positioned in or behind the aft area so that the drive as-
sembly extends into and spans between the fore and aft
areas.

[c17] 17.The motorcycle as claimed in claim 16,
said power take-off component drivingly intermeshing
with one of said endless and driven elements.

[c18] 18.The motorcycle as claimed in claim 17,

said one of said endless and driven elements being said driven element,
said driven element comprising a toothed flywheel.

[c19] 19. The motorcycle as claimed in claim 16,
said drive assembly including an endless drive element drivingly entraining said rotatable components.

[c20] 20. The motorcycle as claimed in claim 10; and
a side cover at least partially enclosing said crankshaft,
said air induction system including a generally flat support bracket supporting said supercharger on said side cover,
at least a portion of said support bracket extending between said leg paths with said at least a portion of said support bracket being positioned entirely inboard of the leg paths.

[c21] 21. A method of supercharging a motorcycle comprising the steps of:
(a) determining a generally normal operating position for a rider operating the motorcycle while mounted thereon wherein the rider's legs are received in a pair of leg-receiving areas spaced on either side of the chassis of the motorcycle;
(b) providing an air induction system to deliver compressed induction fluid to the engine of the motorcycle;

and

(c) positioning the air induction system on the chassis so that the entire air induction system is outside of the leg-receiving areas.

[c22] 22. The method as claimed in claim 21, step (b) including the steps of providing a rotatable impeller that compresses induction fluid for the engine when rotated, providing a power take-off component to take power off of the motorcycle's engine, and rotatably driving said impeller from said power take-off component with a drive assembly that spans between said impeller and power take-off component, step (c) including the steps of positioning the rotatable impeller on the chassis forward of the leg-receiving areas, positioning the power take-off component aftward of the leg-receiving areas so that at least a portion of the drive assembly extends between the leg-receiving areas, and positioning said at least a portion of the drive assembly entirely inboard of the leg-receiving areas.

[c23] 23. The method as claimed in claim 22, step (a) further including the steps of identifying a corresponding curvilinear leg path generally defined by each leg-receiving area that extends between the motorcycle's seat and a respective one of the motorcycle's foot supports that mimics the corresponding rider's leg when the

rider is mounted on the seat in the normal operating position, identifying lower innermost contact points along the leg paths where the rider's feet flank the motorcycle, identifying upper innermost contact points along the leg paths where the rider's knees flank the motorcycle, and identifying common planes on either side of the motorcycle that extend generally parallel with the longitudinal axis of the motorcycle and include the respective leg paths,

step (c) further including the step of positioning the entire drive assembly inboard of the common planes.

[c24] 24.The method as claimed in claim 22,
step (b) further including the steps of removing the motorcycle's original crankshaft side cover, intermeshing the power take-off component with the motorcycle's flywheel, and replacing the original side cover with a different side cover that at least in part rotatably supports the power take-off component.

[c25] 25.The method as claimed in claim 24,
step (b) further including the steps of fixing a generally flat support bracket to the different side cover and supporting the supercharger on the support bracket.

[c26] 26.The method as claimed in claim 23,
said lower innermost contact points being spaced apart

generally between about eighteen and forty-two inches, said upper innermost contact points being spaced apart generally between about twelve and thirty-six inches, said common planes angling relative to the longitudinal axis of the motorcycle generally between about five and thirty-five degrees.

[c27] 27.A supercharged motorcycle comprising:
a chassis operable to be mounted by a rider and including a front wheel and a rear wheel longitudinally spaced from said front wheel;
an engine including a rotatable crankshaft generally positioned between said wheels;
a drive train drivingly interconnecting said crankshaft and said rear wheel and including a rotatable driven element longitudinally spaced from said crankshaft and an endless element drivingly interconnecting said crankshaft and said driven element; and
an air induction system operable to deliver compressed induction fluid to the engine and including a supercharger and a drive assembly,
said drive assembly drivingly interconnecting said drive train and said supercharger and including an indirect power take-off component drivingly engaging one of said driven and endless elements.

- [c28] 28.The motorcycle as claimed in claim 27,
said one of said driven and endless elements being said
driven element,
said driven element comprising a flywheel.
- [c29] 29.The motorcycle as claimed in claim 27,
one of said driven and endless elements being said end-
less element.
- [c30] 30.The motorcycle as claimed in claim 29,
said endless element comprising a cogged belt.
- [c31] 31.The motorcycle as claimed in claim 29,
said endless element comprising a chain.
- [c32] 32.The motorcycle as claimed in claim 27,
said supercharger including a rotatable impeller that
compresses induction fluid for the engine when rotated.
- [c33] 33.The motorcycle as claimed in claim 32,
said supercharger being forwardly and longitudinally
spaced from said crankshaft to thereby define a fore area
therebetween.
- [c34] 34.The motorcycle as claimed in claim 33,
said driven element being aftwardly and longitudinally
spaced from said crankshaft to thereby define an aft area
therebetween.

- [c35] 35. The motorcycle as claimed in claim 34,
said drive assembly including a foremost rotatable supercharger-driving component longitudinally spaced from said crankshaft and positioned in or forward of the fore area,
said power take-off component being longitudinally spaced from said crankshaft and positioned in or behind the aft area so that the drive assembly extends into and spans between the fore and aft areas.
- [c36] 36. The motorcycle as claimed in claim 27,
said drive assembly including a rotatable supercharger-driving component spaced from said power take-off component,
said drive assembly further including an endless drive element drivingly entraining said supercharger-driving and power take-off components.
- [c37] 37. The motorcycle as claimed in claim 36; and
a side cover at least partially enclosing said crankshaft,
said power take-off component being rotatably supported on said side cover.
- [c38] 38. The motorcycle as claimed in claim 37,
said air induction system including a generally flat support bracket supporting said supercharger on said side

cover.

[c39] 39.The motorcycle as claimed in claim 38,
said air induction system including an intercooler positioned downstream of said supercharger and upstream of said engine.

[c40] 40.A supercharged vehicle comprising:
a chassis;
an engine; and
an air induction system operable to deliver compressed induction fluid to the engine and including a supercharger and a supercharger drive,
said supercharger drive being drivingly connected relative to said engine and operable to supply power to said supercharger,
said supercharger drive including first and second rotatable drive members that cooperate to transfer driving power from the engine to the supercharger,
said supercharger drive further including a breakaway coupler assembly selectively interconnecting said drive members so that the members are normally drivingly connected by the coupler assembly under a variable torsion force,
said coupler assembly being configured to drivingly disconnect the members and enable the members to rotate independently of one another for at least one revolution

when said torsion force exceeds a predetermined value.

- [c41] 41.The vehicle as claimed in claim 40,
said breakaway coupler assembly including a disc,
said first and second drive members being gears and
each presenting a common rotational axis with said disc.
- [c42] 42.The vehicle as claimed in claim 41,
said coupler assembly further including a first pin pro-
jecting from said first drive gear into said disc and a sec-
ond pin projecting from said second drive gear into said
disc.
- [c43] 43.The vehicle as claimed in claim 42,
said first and second pins being radially offset from each
other relative to the rotational axis.
- [c44] 44.The vehicle as claimed in claim 43,
said disc being formed from an elastomeric material pre-
senting a sheer modulus substantially less than the
sheer moduli presented by at least one of said first and
second drive gears.
- [c45] 45.The vehicle as claimed in claim 40,
said supercharger including a rotatable impeller operable
to compress induction fluid for the engine when rotated.
- [c46] 46.The vehicle as claimed in claim 45,

said supercharger drive including a supercharger transmission in driving communication with said impeller and a drive assembly in driving communication between said engine and said supercharger transmission.

[c47] 47.The vehicle as claimed in claim 40,
said chassis being operable to be mounted by a rider
and including a front wheel and a rear wheel longitudinally spaced from said front wheel,
said engine including a rotatable crankshaft spaced between said wheels.

[c48] 48.The vehicle as claimed in claim 47,
said front and rear wheels being generally aligned.

[c49] 49.The vehicle as claimed in claim 47; and
a drive train drivingly interconnecting said crankshaft and said rear wheel and including a rotatable driven element longitudinally spaced from said crankshaft and an endless element drivingly interconnecting said crankshaft and said driven element.

[c50] 50.The vehicle as claimed in claim 49,
said first rotatable drive member drivingly intermeshing with one of said driven and endless elements.

[c51] 51.The vehicle as claimed in claim 50,
said one of said elements being said driven element,

said driven element comprising a flywheel.

[c52] 52.The vehicle as claimed in claim 51,
said first and second rotatable drive members comprising gears,
said supercharger drive further including a transfer gear drivingly intermeshing with said second rotatable drive gear.

[c53] 53.The vehicle as claimed in claim 52,
said supercharger drive further including first and second rotatable sheaves and an endless drive element drivingly entraining said sheaves,
said first rotatable sheave being fixed relative to said transfer gear so that said first rotatable sheave is driven by said transfer gear.

[c54] 54.The vehicle as claimed in claim 53,
said supercharger including a rotatable impeller operable to compress induction fluid for the engine when rotated,
said second rotatable sheave being fixed relative to said impeller.

[c55] 55.A method of supercharging a motorcycle comprising the steps of:
(a) rotatably driving the motorcycle's crankshaft off of the motorcycle's engine;

(b) simultaneously rotatably driving an impeller off of the motorcycle's crankshaft to compress induction fluid for the motorcycle's engine when the crankshaft is rotated; and

(c) preventing one of the impeller and crankshaft from rotating while the other one continues to rotate.

[c56] 56.The method as claimed in claim 55; and

(d) simultaneously rotatably driving the motorcycle's rear wheel off of the crankshaft to propel the motorcycle when the crankshaft is rotated.

[c57] 57.The method as claimed in claim 55,

step (b) further including the steps of intermeshing a first gear with the motorcycle's flywheel, and driving an endless drive element with the gear to rotatably drive the impeller.

[c58] 58.The method as claimed in claim 57,

step (b) further including the steps of coupling a second gear to the first gear with an elastomeric disc.

[c59] 59.The method as claimed in claim 58,

step (b) further including the steps of fixing at least one first pin relative to the first gear and projecting the first pin into the elastomeric disc and fixing at least one second pin relative to the second gear and projecting the

second pin into the elastomeric disc,
step (c) further including the steps of preventing the
second gear from rotating so that the second pin shears
through the elastomeric disc without contacting the first
pin so that the first gear continues to rotate.